American Museum Novitates

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK 24, N.Y.

NUMBER 2164 DECEMBER 19, 1963

Four New Species of *Magelona* (Annelida, Polychaeta) and a Redescription of *Magelona longicornis* Johnson

By Meredith L. Jones[1]

INTRODUCTION

In spite of the rather extensive collections of polychaetes made in the Caribbean area, there have been no records of the monotypic genus *Magelona.* In the Gulf of Mexico there was but a single species recorded, and this, from a single locality. On the basis of personal collections and other material, it is apparent that at least one species of *Magelona* is widespread throughout the Gulf and that there are at least two more species in the general Gulf-Caribbean region.

The material to be reported upon below was made available through the kind offices of a number of biologists, and certain collections were made possible by the support of various institutions and granting agencies. I take the liberty of listing them individually, for, without their help and generosity, this study could not have been made: the Lamont Geological Observatory, Palisades, New York, Dr. Maurice Ewing, Director; the Council of the Scientific Staff, the American Museum of Natural History; the Lerner Marine Laboratory, Bimini, Bahamas, Mr. Robert Mathewson, Director; the Marine Laboratory of the Oceanographic Institute, Florida State University, Alligator Harbor, Florida, Dr. Sidney W. Fox,

[1] Assistant Curator, Department of Living Invertebrates, the American Museum of Natural History.

then Director; the Department of Biological Sciences, Florida State University, Dr. Leland Shanor, Head; the Office of Naval Research (Grant N.R. 163–396, with the Oceanographic Institute, Florida State University); the Institute of Marine Science, University of Texas, Dr. H. T. Odum, Director; Dr. Neil C. Hulings, Texas Christian University and Mr. R. A. Waller, United States Fish and Wildlife Service, Pascagoula, Mississippi, for their assistance in making collections; and Dr. Ivan M. Goodbody, University College of the West Indies, Jamaica; Dr. R. Winston Menzel, Oceanographic Institute, Florida State University; Mr. Harold W. Sims, Pigeon Key Field Station, Florida State Board of Conservation; Mr. Jack Taylor, University of Florida; and, especially, Dr. Marian H. Pettibone, United States National Museum, Smithsonian Institution, for the loan of material.

The descriptions to follow are concerned with one old taxon and five new taxa:

Magelona phyllisae, new species
Magelona polydentata, new species
Magelona riojai, new species
Magelona pettiboneae, new species
Magelona pettiboneae lanceolata, new subspecies
Magelona longicornis Johnson, 1901

SYSTEMATIC ACCOUNT

Magelona phyllisae, new species

Figures 1–11

DIFFERENTIAL DIAGNOSIS: *Magelona* with bidentate hooded hooks; with anterior horns on the prostomium; with neither dorsal nor ventral "cirri" in any part of the body.[1]

TYPE LOCALITY: Lamont Geological Observatory Station V-15-68 (latitude 09° 40′ S., longitude 79° 28′ W.), off shore from Santa, Peru; dredged at a depth of 181 meters; collected on December 8, 1958.

DESCRIPTION: The collection includes 12 specimens, none of which is ovigerous. Representative specimens, all consisting of anterior fragments 0.25 mm. in width, have lengths of 12 mm. (for 34 setigerous segments),

[1] As Day (1961, p. 495) implies, the terms "dorsal" and "ventral cirri" of previous authors probably represent medial extensions of the postsetal lamellae. Rather than the terms "superior" and "inferior" lamellae, "lateral" and "medial" lamellae are used (for the superior notopodial lamella is not the morphological counterpart of the superior neuropodial lamella).

6 mm. (for 26 setigers), and 8 mm. (for 27 setigers). A smaller, complete specimen, obviously juvenile, is 4.5 mm. long, 0.25 mm. wide, and is comprised of 16 setigers.

In these specimens, initially preserved in formalin and now in 70 per cent alcohol, there are no patterns of pigmentation. In the posterior region there are lateral aggregations of yellowish opaque granules, the so-called "glandular" regions reported by previous authors in other magelonids.

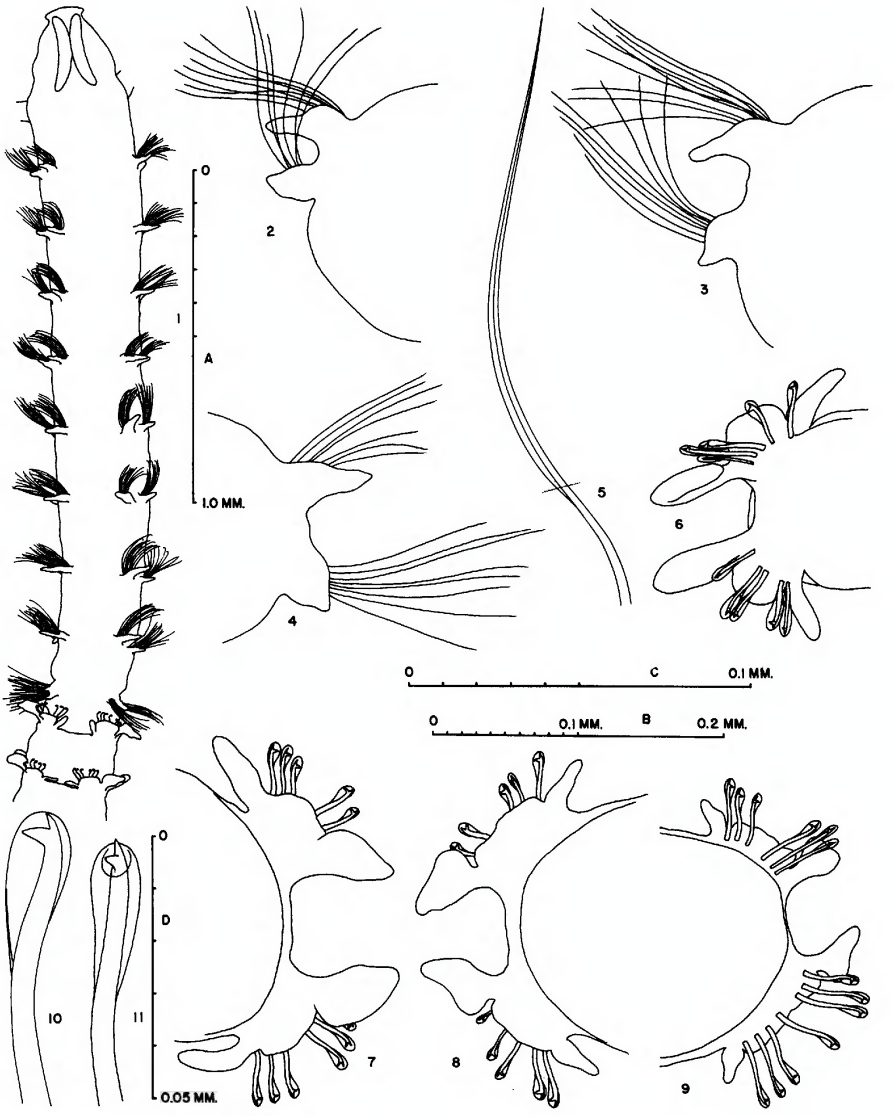
The prostomium (fig. 1) has the general outline of an equilateral triangle, truncated anteriorly, and is provided with a pair of frontal horns. There appears to be one pair of prostomial ridges which are weakly arcuate. There are no eyes. The achaetous region between the insertion of the palps and the setal bundles of the first setiger is approximately equal to the distance between the setal bundles of the first and second setiger. The proboscis is a smooth, thin-walled sac.

The palps extend to about the tenth setiger. Basally, there are four rows of papillae on the palps, but, apically, there are only two rows. The papillae are unpigmented throughout.

Each anterior setiger is provided with paired, lateral, postsetal lamellae that are dorsolaterally inserted (figs. 2, 3). The lamellae are subequal and tend to be somewhat attenuated. Medial lamellae are not present in the anterior region.

The distance between the ninth and tenth setal bundles is somewhat less than between others, but the ninth setiger is not especially crowded. The shapes of the postsetal lamellae of the ninth setiger (fig. 4) are similar to those of the anterior region; however, the lamellae and their accompanying setae are more laterally placed. The setae of the ninth setiger (fig. 5) are not specialized but are similar to the setae of the anterior region. They are unilimbate capillaries that tend to be gently sigmoid in shape.

The tenth setiger (fig. 6), and all those more posterior, are provided with dorsal and ventral, paired, postsetal processes. The thin, central lobe bears hooded hooks and is continuous with discrete, foliaceous lamellae, one lateral and one medial. In general the lamellar lobes and the setae tend to be directed anteriorly (fig. 1). At the beginning of the posterior region (fig. 6), the central lamellar lobe is high but rather narrow; in progressively more posterior setigers, the central lamella becomes broader and lower (figs. 7–9). Similarly, the more posterior parapodia show a reduction in the size of the medial and lateral lamellae, until the medial lamellae of the twenty-eighth setiger (fig. 9) approach the relative size and shape of medial lamellae of other species of *Magelona*.



FIGS. 1–11. *Magelona phyllisae*, new species. 1. Dorsal view of anterior region of body, main part of palpi omitted. 2. Posterior view of left fifth setiger. 3. Posterior view of left eighth setiger. 4. Posterior view of right ninth setiger. 5. Unilimbate capillary seta from ninth setiger. 6. Anterior view of right tenth setiger. 7. Posterior view of right seventeenth setiger. 8. Posterior view of left twenty-third setiger. 9. Anterior view of left twenty-eighth setiger. 10. Profile view of a hooded hook. 11. Three-quarter view of a hooded hook.

1, scale A; 2–4, 6–9, scale B; 5, scale C; 10, 11, scale D.

By the seventeenth setiger (fig. 7) the medial postsetal lamellae are slightly attenuated and are nearly pedunculate, so great is the constriction of their insertion. Tufts of cilia were not observed between the lateral lamellae of any setigers.

There are up to seven hooded hooks per fascicle, and, in all cases, the hooks are arranged in two series (*vis à vis*, within a fascicle). The tips of the hooks are usually completely covered by transparent unornamented hoods (fig. 10), although in some specimens the tip of the hook protrudes from the aperture of the hood (fig. 11). The hooks are bidentate (fig. 11). The main fang is at nearly right angles to the main axis, and the single accessory tooth is an extension of the gentle curve of the body of the hook.

The specific name *phyllisae* inadequately honors Mrs. William E. Fish, secretary and mainstay of this department, who typed this manuscript, but who will type no more.

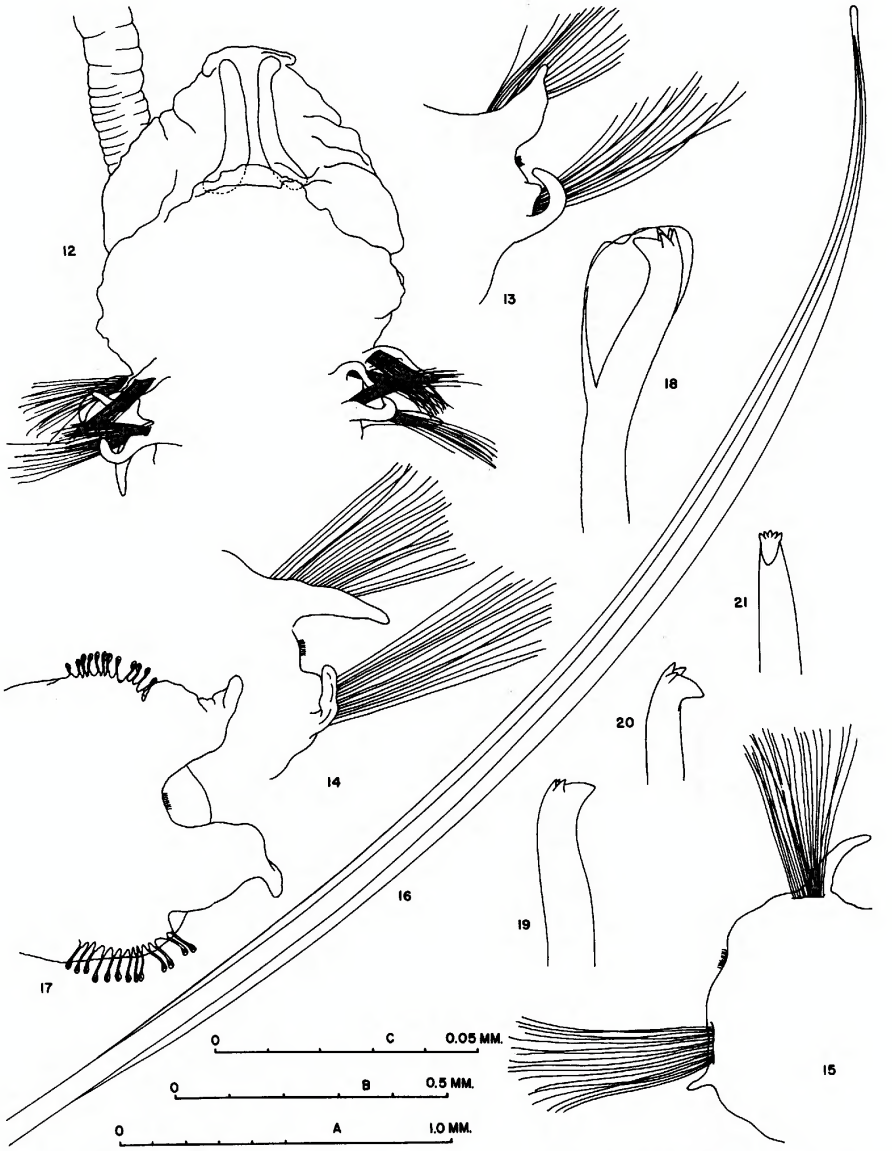
TYPE DISPOSITION: The holotype (A.M.N.H. No. 3634) and some paratypes (A.M.N.H. No. 3635) are deposited in the collections of the American Museum of Natural History. Additional paratypic material has been deposited in the collections of the United States National Museum.

DISCUSSION: *Magelona phyllisae* most closely resembles *M. annulata* Hartmann-Schröder (1962), *M. cerae* Hartman and Reish (1950), and *M. pacifica* Monro (1933). *Magelona phyllisae* is readily distinguished from *M. annulata* in that the former has no papilliform extensions of the central postsetal lamella in posterior abdominal setigers (cf. Hartmann-Schröder, 1962, fig. 99d) and does have well-developed medial postsetal lamellae on anterior abdominal setigers. *Magelona cerae* exhibits the following points of contrast with *M. phyllisae:* the presence of a notopodial medial postsetal lamella in the anterior region; a difference in the shape of lateral postsetal lamellae of the posterior region; the absence of medial lamellae in the posterior region; and a difference in the structure of the hooded hooks. The morphology of all the postsetal lamellae of *M. pacifica* is so different from that of *M. phyllisae* that there is no basis of comparison as regards this criterion. In addition, *M. pacifica* lacks medial lamellae in the posterior region.

Magelona polydentata, new species

Figures 12–21

DIFFERENTIAL DIAGNOSIS: *Magelona* with hooded hooks which bear from three to five (usually four) accessory teeth above the main fang; with anterior horns; parapodia provided only with lateral lamellae.



FIGS. 12–21. *Magelona polydentata*, new species. 12. Dorsal view of prostomial region, tip of left palp omitted, right palp missing. 13. Posterior view of right fourth setiger. 14. Posterior view of right eighth setiger. 15. Anterior view of right ninth setiger. 16. Bilimbate capillary seta from the ninth setiger. 17. Posterior view of right tenth setiger. 18. Profile view of a hooded hook. 19. Profile view of a hooded hook with three accessory teeth. 20. A nearly profile view of a hooded hook with three accessory teeth. 21. Full-face view of a hooded hook with five accessory teeth.

12, scale A; 13–15, 17, scale B; 16, 18–21, scale C.

TYPE LOCALITY: Bimini Lagoon, Bahamas (the holotype was collected in *Thalassia* flats near the Lerner Marine Laboratory pier on August 27, 1962; paratypes from Bimini were found at two stations, one specimen at each, between Tokas Cay and South Bimini, also in grass flats, collected on August 29, 1962).

DISTRIBUTION: Bimini, Bahamas; Indian Pass, Gulf County, Florida (collected on November 21, 1959, from a barely subtidal substrate of sand and shell fragments); North Bay, Bay County, Florida (one specimen collected in October, 1958, with a van Veen grab sampler from a mud-sand substrate at a depth of 20 feet); and East Middle Ground, Port Royal, Jamaica (one specimen collected on February 4, 1962, at a depth of 85 feet).

DESCRIPTION: The following account is based on the six specimens from the locations listed above. From Bimini, the holotype, which is ovigerous and incomplete posteriorly, is 38 mm. long and 1.25 mm. at its widest (78 setigers); the paratypes, also incomplete, are 20 mm. long and 2.0 mm. wide (44 setigers), and 20 mm. long and 1.2 mm. wide (49 setigers). The single incomplete specimen from Indian Pass is 27 mm. long and 1.5 mm. wide (81 setigers). The specimen from North Bay is complete posteriorly and is 19 mm. long and 1.0 mm. wide (60 setigers). The single specimen from Port Royal is incomplete and is 8 mm. long and 0.75 mm. wide (20 setigers).

Although the holotype exhibits a striking pigmented area extending from the fifth to the ninth setigers in the anterior region, it is believed that this does not constitute a valid taxonomic character. To be sure, such a band is faintly indicated on the other specimens from Bimini, but it is entirely lacking in the remaining specimens examined. All these polychaetes received essentially the same preservation treatment (10% formalin, initially, and subsequent storage in 70% ethanol), so these differences seem not to be preservation artifacts, but actual variation in pigmentation. In addition, there is also some variation in the color and distribution of aggregations of opaque granules. In all cases these are present, laterally, on all setigers posterior to the ninth. In all specimens but the one from Indian Pass, and possibly the specimen from North Bay, these opaque clumps are white. The granular aggregations of the specimen from Indian Pass are yellowish, and the color of these opaque areas in the case of the North Bay specimen is not known, since the aggregations take up Rose Bengal selectively and are masked by this red stain. There is further variation in the distribution of granules in the anterior region. Paired, dorsal, granular aggregations in the anterior region were seen in all but the specimen from Jamaica.

The prostomium of *Magelona polydentata* (fig. 12) has the outline of a broad-based triangle. The prostomial width is approximately one and one-half times its length. Only a single pair of prostomial ridges were noted; these are well-separated, their mid-regions are relatively straight, and their ends are somewhat curved, the anterior ends tending toward the single pair of frontal horns. No eyes are visible. The length of the achaetous region following the prostomium is rather variable. It may be as much as twice the distance between the first and second setiger, or equal to this distance. The proboscis was not everted in any of the specimens examined.

The number of rows of papillae on the basal portion of the palps varies from four to 14 among the three specimens from Bimini. The remaining specimens fall within this range. All specimens have from two to four apical rows of palpal papillae. In all specimens the papillae are unpigmented throughout.

Extreme anterior parapodia are located in the dorsolateral region (fig. 13), but at the level of the eighth setiger, they are truly lateral (fig. 14). The parapodia are elevated from the general body surface as rather thin ridges. Both notosetal and neurosetal fascicles are accompanied by a single postsetal lamella. It would appear from their position, relative to the setal bundles, that the dorsal lamella is a lateral lamella and the ventral is a medial lamella.

The ninth setiger (fig. 15) abruptly marks the division between the anterior and posterior regions, not only by its quite compressed appearance, but also by the shift in location of the notopodium. Where the notopodial fascicle and lamella of the eighth setiger were nearly lateral, those of the ninth setiger are definitely dorsal in position. The setae of the anterior setigers are similar to those of the ninth; they are unspecialized bilimbate capillaries provided with a wide and a narrow limbation (fig. 16).

Posterior setigers are all similar (fig. 17). Dorsal and ventral rows of hooded hooks are borne on slightly raised ridges, and, as in the case of *Magelona phyllisae*, are arranged in *vis à vis* halves in each series. There are from 11 to 17 hooks in each fascicle of the tenth setiger and somewhat fewer (six to 11) in the eighteenth setiger. Each setiger is provided with two pairs of lateral lamellae. Tufts of cilia were observed between the lateral lamellae of all setigers.

The fine structure of the hooded hooks are the unique characteristic of this species. Whereas all other species of *Magelona* heretofore described possess hooded hooks that are bidentate (fig. 11) or tridentate (fig. 33), those of *M. polydentata* are provided with from three to five accessory teeth

above the main fang (figs. 18–21). Most commonly there are four accessory teeth of equal size (fig. 18), hooks with five accessory teeth (fig. 21) are not uncommon, and there are some hooks with three accessory teeth (fig. 20). In profile (fig. 19), the hooded hooks of *M. polydentata* are readily recognized, for the large, relatively blunt, main fang is at nearly right angles to the main axis of the shaft, and the very short accessory teeth arise far back on the main fang. Usually the hook does not extend beyond its hood.

Of the six specimens, only the three from Bimini were found in association with a tube. In these cases it was a thin, yellow, membranous structure to which foraminifera tests and other calcareous debris were attached.

The specific name *polydentata* refers to the number of accessory teeth of the hooded hooks.

Type Disposition: The holotype (A.M.N.H. No. 3636) and most of the paratypes (A.M.N.H. Nos. 3637–3640) are deposited in the collections of the American Museum of Natural History. One paratype (from Bimini) has been deposited in the collections of the United States National Museum.

Discussion: So far as can be determined, the structure of the hooded hooks of *M. polydentata* is unique among the Magelonidae. Apart from the structure of the hooks, there appears to be a general similarity to *M. japonica* Okuda (1937) as regards the form and placement of the lamellae of the anterior region. However, the whole structure of the ninth setiger, the presence of paired medial lamellae on posterior setigers, as well as the tridentate condition of the hooks (all characteristics of *M. japonica*), would seem to indicate no close relationship between these two species.

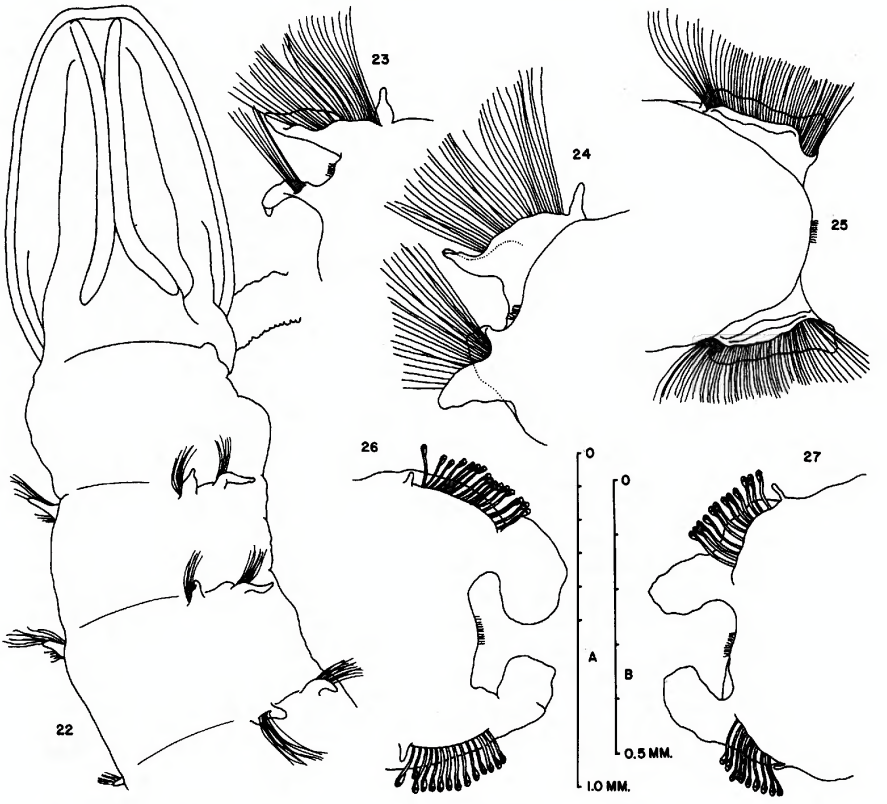
Magelona riojai, new species

Figures 22–35

Differential Diagnosis: *Magelona* with tridentate hooded hooks; without prostomial horns; with specialized crenulate and mucronate setae on the ninth setiger; with the anterior margin of the prostomium truncated and forming a nearly straight line.

Type Locality: Antón Lizardo, state of Veracruz, Mexico (holotype and six paratypes were collected from a low intertidal to barely subtidal sand substrate on August 9, 1962).

Distribution: Antón Lizardo, Mexico; Veracruz [city], Mexico (three specimens collected from a barely subtidal sand substrate, inside



FIGS. 22–27. *Magelona riojai*, new species. 22. Dorsal view of anterior region of body, tip of right palp omitted, left palp missing. 23. Anterior view of right fifth setiger. 24. Posterior view of left eighth setiger. 25. Anterior view of left ninth setiger. 26. Anterior view of left tenth setiger. 27. Anterior view of right eighteenth setiger.

22, scale A; 23–27, scale B.

the breakwater near the Marine Biological Station of the Technological Institute of Veracruz, on August 6, 1962); and Indian Pass, Gulf County, Florida (two specimens collected on November 21, 1959, from a barely subtidal substrate of sand and shell fragments).

DESCRIPTION: The holotype is ovigerous and posteriorly complete. It is comprised of 68 setigers and is 32 mm. in length and 0.5 mm. in width. A complete, non-ovigerous paratype is 26 mm. long, 0.8 mm. wide, and has 66 setigers. Specimens from Veracruz are somewhat smaller: one, an anterior fragment, is 7.5 mm. long and 0.3 mm. wide for 24 setigers; another anterior fragment of 25 setigers is 6 mm. long and 0.3 mm. wide;

and the third specimen, a complete juvenile, is 5 mm. long, 0.2 mm. wide, and has 32 setigers. Of the two specimens from Indian Pass one is complete (78 setigers, 41 mm. long, and 1.0 mm. wide) and the other is an anterior fragment (68 setigers, 26 mm. long, and 1.0 mm. wide).

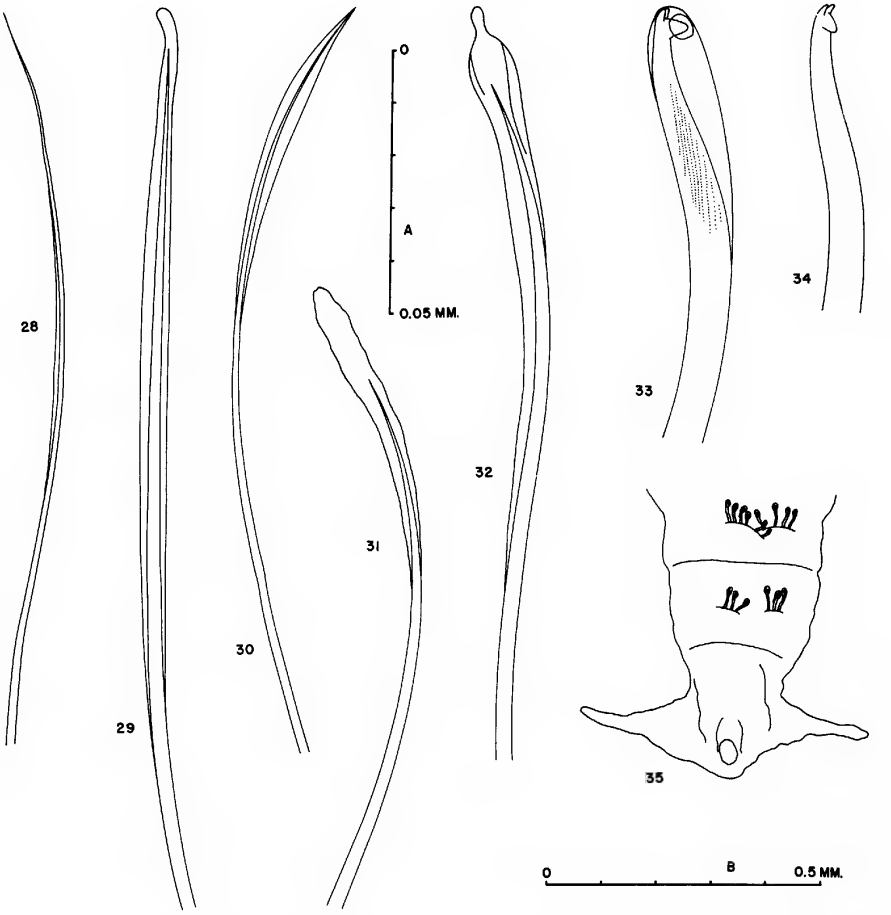
Of the three lots of *Magelona riojai*, only the two specimens from Indian Pass have not been treated with Rose Bengal. These show no pigmentary patterns on the body, but there are accumulations of opaque granules which, in the stained specimens from Antón Lizardo and Veracruz, selectively take up Rose Bengal. On the dorsal surface of the anterior region, these granular areas are paired in the first three setigers. From the fourth to ninth setigers they are fused medially to form arcuate transverse bands. In the posterior region, from the tenth setiger on, the granular accumulations are mainly lateral, but extend slightly onto the dorsal and ventral surfaces. While the granules are not pigmented, in all the specimens examined there is a pigment pattern associated with the distal region of the palps. Here there is a general darkening of the entire palp tip, and there are dark pigment spots on the bases of the papillae. A similar pigmentation pattern has been reported by Gravier (1906) in the case of *Magelona obockensis*.

The prostomium of *M. riojai* (fig. 22) is about one-half again as long as it is wide (length : width = 1.6 : 1.0). The anterior tip is nearly straight; there are no prostomial horns, and the anterior tip appears truncated. A pair of prostomial ridges are fused for nearly half of their length, and both the anterior and posterior ends diverge from this line of fusion. There also appear to be a second, lateral, pair of ridges, about twice as wide as the medial pair.

The palps are inserted on the ventroposterior surface of the prostomium and bear a variable number of rows of papillae. The specimens from Mexico exhibit four rows proximally and two rows distally, while those from Florida may bear up to eight rows in the proximal region and four rows distally. The papillae of the distal one-third of the palps are tinged with a dark pigment, which is restricted to their bases; this gives a dusky aspect to the tips of the palps.

The extreme anterior parapodia are situated in the dorsolateral region (fig. 23). At the level of the eighth setiger (fig. 24) the neuropodial setal fascicle and associated lamellae are nearly ventrolateral. Throughout the anterior region a small cirriform dorsal medial lamella is present (figs. 23, 24). Dorsal lateral lamellae are U-shaped in cross section, and presetal and postsetal portions meet ventrally.

The ninth setiger (fig. 25) lacks both dorsal and ventral medial lamellae. The lateral lamellae are comprised of rather well-developed presetal and



FIGS. 28–35. *Magelona riojai*, new species. 28. Unilimbate capillary from fifth setiger. 29. Bilimbate capillary seta from eighth setiger. 30. Bilimbate capillary seta from lateral region of the fascicle of the ninth setiger. 31. Modified bilimbate seta from central region of the fascicle of the ninth setiger. 32. Mucronate bilimbate seta from medial region of the fascicle of the ninth setiger. 33. Profile view of a hooded hook. 34. Three-quarter view of a hooded hook, hood omitted. 35. Dorsal view of pygidial region.

28–34, scale A; 35, scale B.

postsetal lobes and are in the dorsolateral and ventrolateral areas.

Posterior setigers of *Magelona riojai* are similar throughout (figs. 2, 27). Lateral lamellae are lobes, usually rounded to nearly squared-off. There are but slight indications of a constriction at the point of attachment, and, more usually, there is a broad base of attachment (fig. 26). The

lateral lamellae merge into a transverse ridge which lies just posterior and parallel to the linear row of hooded hooks. Medial lamellae are represented throughout by small cirriform structures, medial to the hooks. There are from 14 to 17 hooks in the fascicles of the tenth setiger and from ten to 12 in those of the eighteenth. In all cases the main fangs of the hooks are oriented laterally. Tufts of cilia were observed between the lateral lamellae of all setigers.

The setae of the anterior region may be finely unilimbate (fig. 28) or bilimbate (fig. 29). The limbation of the unilimbate capillaries is restricted to the central region of the seta, while in the bilimbate types, the limbations may meet beyond the tip of the shaft.

The setae of the ninth setiger are all capillaries with variously modified limbations. In all four fascicles a few of the most lateral setae are bilimbate (fig. 30); the limbations in these setae do not extend beyond the tip of the shaft. In the central part of the fascicles there are numerous bilimbate setae in which the limbations extend beyond the shaft as elongate structures (fig. 31). These are similar to the expanded crenulate setae described by Hartman (1944a) for *Magelona pitelkai*, except that these setae, in *M. riojai*, do not exhibit a pointed tip. In the most medial regions of the four fascicles of the ninth setiger there are limbate capillary setae the tips of which are mucronate (fig. 32).

The hooded hooks of *M. riojai* are all tridentate (figs. 33, 34). The main fang is approximately at right angles to the axis of the shaft, and the two accessory teeth are erect and parallel to the axis of the shaft. The main fang does not protrude through the aperture of the hood.

In the posterior regions of certain of the specimens observed, i.e., from Antón Lizardo and Indian Pass, lateral pouches were noted between the parapodia. Their distribution along the length of the various worms was irregular and sporadic and seemed not to be correlated to the reproductive state of the animal. Curiously, they were seen in specimens from Antón Lizardo, but were not observed in worms collected three days earlier from Veracruz, some 15 miles away. The pouches appear to be identical with similar structures described by Hartman (1961) for *Magelona sacculata* and others (see below).

The pygidium (fig. 35) bears the barely subterminal anus and a pair of lateral anal cirri.

No tubes were found associated with any of the specimens.

It is with great pleasure that I name this species of *Magelona* in honor of Prof. E. Rioja, Instituto de Biología, University of Mexico, who has contributed greatly to the knowledge of the polychaetes of both coasts of Mexico.

TYPE DISPOSITION: The holotype (A.M.N.H. No. 3641) and three paratypic lots (A.M.N.H. Nos. 3642–3644) are deposited in the collections of the American Museum of Natural History. Some paratypes from Antón Lizardo have been deposited in the collections of the United States National Museum.

DISCUSSION: On the basis of the tridentate condition of the hooded hooks, the lack of prostomial horns, and the presence of special setae on the ninth setiger, *Magelona riojai* appears to be most closely allied to *M. obockensis* Gravier (1905), *M. papillicornis* Müller (1858), and *M. sacculata* Hartman (1961).

Magelona obockensis is readily differentiated from *M. riojai* in that, in *M. obockensis*, the specialized setae of the ninth setiger are not mucronate, but bear asymmetrically expanded subterminal limbations; the ventral medial lamellae of the posterior region arise *lateral* to the rows of hooded hooks, not medial to them; and the lateral lamellae of the posterior region are oval and are borne upon distinctly constricted bases.

Magelona sacculata differs from *M. riojai* in both the shape and the relative dimensions of the prostomium (length : width = 0.9 : 1), as well as the type of limbation shown by the non-mucronated setae of the ninth setiger, these being asymmetrical in *M. sacculata* and symmetrical and elongate in *M. riojai* (fig. 31).

In the case of *M. papillicornis*, it is the rounded anterior prostomial margin and the structure of the non-mucronated setae of the ninth setiger that serve to separate this species from *M. riojai.*

It will be noted that I have declined to use the "conspicuous lateral pouched membranes" of *M. sacculata* (Hartman, 1961, p. 102) as a criterion of identification. It would seem that the presence of such sac-like structures in *M. riojai* (see above), in *M. obockensis* (Gravier, 1906, pl. 2, fig. 192), and in *M. papillicornis* (McIntosh, 1915, p. 227; Day, 1961, p. 495), as well as in *M. sacculata*, vitiates this as a characteristic of taxonomic differentiation. However, the presence of this structure in these four species serves to emphasize the close relationship among them.

As a final note, it might be well to mention several points of interest that emerged during a perusal of the literature.

In the first of the two descriptions, Gravier (1905) referred to the hooded hooks of *Magelona obockensis* as bidentate, but then went on to state that the "posterior" tooth was double. Gravier presented no illustrations with this, the first species description. In the following year he published a more detailed, illustrated, description of the species from the Red Sea in which he clearly shows the hooded hooks to be tridentate (Gravier, 1906, text fig. 333).

It would seem that McIntosh (1915), in his comprehensive treatment of *Magelona papillicornis*, neglected to mention the presence of dorsal and ventral medial lamellae in the posterior region, for these structures were noted previously by him (McIntosh, 1911) and even earlier by Mesnil (1896), in the same species. In his first description of *Magelona papillicornis*, McIntosh (1877) apparently did not observe these structures. From personal experience it can be said that it is frequently quite difficult to make parapodial preparations that show the medial lamellae, for they are quite often exceedingly small and may be inserted at some distance from the medial ends of the rows of hooded hooks.

Magelona pettiboneae, new species

Figures 36–47

Magelona, near *californica*, HARTMAN, 1951, pp. 90–91; Alligator Harbor, Franklin County, Florida.

Magelona californica prox. [*sic*], CARPENTER, 1956, p. 104; Alligator Harbor, Franklin County, Florida.

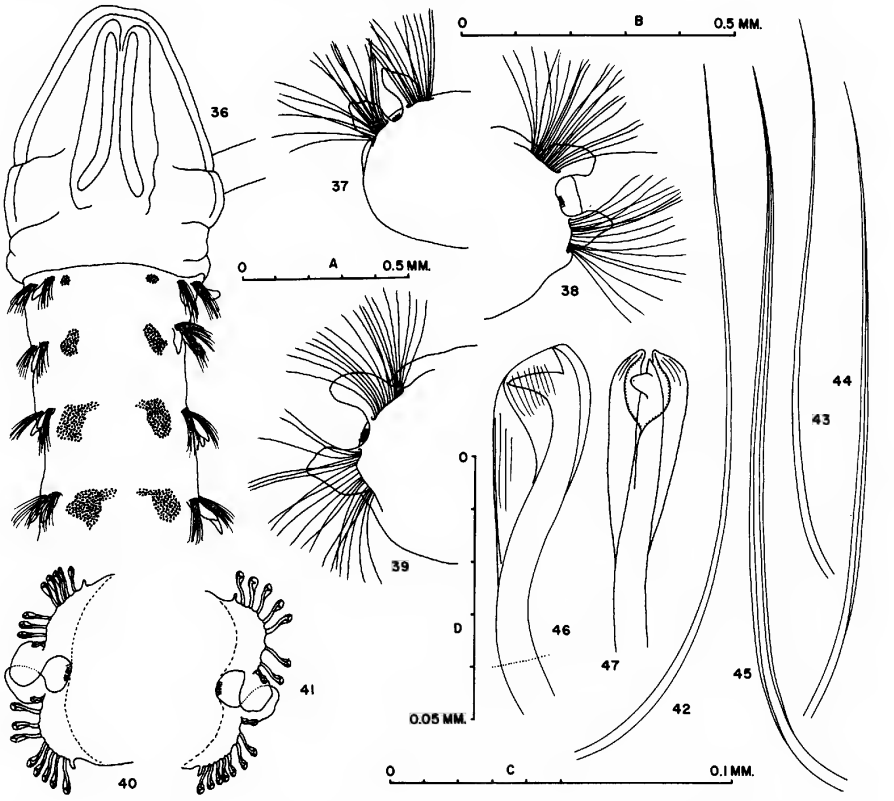
Magelona californica prox. [*sic*], MENZEL, 1956, p. 16; Alligator Harbor, Franklin County, Florida.

DIFFERENTIAL DIAGNOSIS: *Magelona* with bidentate hooded hooks; without prostomial horns; without specialized setae on the ninth setiger; with dorsal and ventral medial lamellae in the posterior region; and with the lateral lamellae of the anterior region erect and sublanceolate.

TYPE LOCALITY: Old Channel, just southeast of the mouth of St. Andrew Bay, Bay County, Florida (the holotype and two paratypes were collected from a sand substrate on October 11, 1957).

DISTRIBUTION: Near the mouth of St. Andrew Bay, Florida; 10 miles offshore from St. Andrew Bay (latitude 30° 00′ 34″ N., longitude 85° 54′ 12″ W., one specimen, collected from a sand substrate at a depth of approximately 100 feet, on September 9, 1959); Alligator Harbor, Franklin County, Florida (23 specimens collected by Donald Carpenter from fine sand on May 20, 1950, and one specimen collected, also from fine sand, on June 27, 1960); Seahorse Key, Levy County, Florida (three lots comprised of one, four, and eight specimens, collected by Jack Taylor on March 5, 1960, September 20, 1960, and June 7, 1961, respectively, from silty sand); and Clearwater, Pinellas County, Florida (one specimen collected from Clearwater Beach by Harold Sims, on December 26, 1960).

DESCRIPTION: Adult *Magelona pettiboneae* vary considerably in size, and there appears to be no obvious correlation of size and locality. Complete individuals range from 20 to 39 mm. in length (for from 80 to 118 setigers)



FIGS. 36–47. *Magelona pettiboneae*, new species. 36. Dorsal view of anterior region of body, tip of right palp omitted, left palp missing; stippled regions represent areas of granular aggregations. 37. Anterior view of right fifth setiger. 38. Anterior view of left eighth setiger. 39. Anterior view of right ninth setiger. 40. Anterior view of right tenth setiger. 41. Anterior view of left eighteenth setiger. 42. Capillary seta from fifth setiger. 43. A second capillary seta from the fifth setiger. 44. Unilimbate capillary seta from the ninth setiger. 45. Bilimbate capillary seta from the ninth setiger. 46. Profile view of a hooded hook. 47. Three-quarter view of a hooded hook.

36, scale A; 37–41, scale B; 42–45, scale C; 46, 47, scale D.

and from 0.25 to 1.00 mm. in width. There are no pigmented areas in any of the specimens examined, although accumulations of brownish yellow opaque granules are present. These granular masses are distributed in much the same pattern (fig. 36) as was the case in *Magelona riojai* (see above). Ovigerous specimens were noted in the collections made in May, September, and October.

The prostomium of *M. pettiboneae* (fig. 36) is slightly longer than wide

and lacks eyes. There are no prostomial horns, and the anterior margin is bluntly rounded. The medialmost of two pairs of prostomial ridges are not fused along their length, and they diverge posteriorly. The lateral pair of ridges are poorly defined.

The palps are inserted on the ventroposterior surface of the prostomium and bear from four to six rows in the proximal region of the papillated area, and two rows in the distal region. The palps and their papillae are unpigmented.

Anterior parapodia (fig. 37) are inserted dorsolaterally, and, by the eighth setiger (fig. 38), the neuropodial setal fascicle and its lateral lamella are laterally placed. Lateral lamellae of the anterior region are relatively small and have a sublanceolate shape. There are no medial lamellae in the anterior region.

By the ninth setiger (fig. 39) both neuropodia and notopodia are lateral, and the lateral lamellae are similar to those in the anterior region. There are no medial lamellae on the ninth setiger.

The posterior setigers (figs. 40 and 41) bear hooded hooks only and are all similar. Lateral lamellae are borne on constricted bases and tend to be oval. The hooded hooks emerge from a thin transverse ridge, and, medial to them, small digitate medial lamellae can be seen. There are from eight to nine hooks in each fascicle, and the hooks are oriented *vis à vis* in two series in each fascicle. Tufts of cilia were observed between the lateral lamellae of all setigers.

The setae of the anterior region (figs. 42, 43) are all capillaries and appear to be non-limbate or, at best, very finely unilimbate. The setae of the ninth setiger are not specialized, but are also capillaries, and are provided with one or two fine limbations (figs. 44, 45).

Hooded hooks of *M. pettiboneae* are all bidentate (figs. 46, 47). The main fang is at right angles to the axis of the shaft, and the rather slender accessory tooth is a curved extension of the shaft axis. The transparent hood totally surrounds the head of the hook, and there is a quite extensive opening through which the hook might protrude (fig. 47). Under oil immersion, the aperture of the hood appears to be serrated.

None of the specimens examined was associated with a tube of any sort, and lateral pouches were not observed in any of the specimens.

It is with grateful appreciation that I name this species in honor of Dr. Marian H. Pettibone, United States National Museum, whose researches on the Polychaeta have contributed so much to our knowledge of this group, and to whom I am indebted for much of the material presently under consideration.

TYPE DISPOSITION: The holotype (A.M.N.H. No. 3645) and paratypic

lots from St. Andrew Bay (A.M.N.H. No. 3646), offshore from St. Andrew Bay (A.M.N.H. No. 3647), from Alligator Harbor (A.M.N.H. Nos. 3648 and 3649), from Seahorse Key (A.M.N.H. Nos. 3650 and 3651), and Clearwater Beach (A.M.N.H. No. 3652) are deposited in the collections of the American Museum of Natural History. Some paratypes from Alligator Harbor and Seahorse Key have been deposited in the collections of the United States National Museum.

Discussion: *Magelona pettiboneae* shows affinities with *M. californica* Hartman (1944b) and *M. minuta* Eliason (1962) on the basis of its bidentate hooded hooks and lack of prostomial horns. The erect, sublanceolate, lateral lamellae of the anterior region of *M. pettiboneae* serve to distinguish it from *M. minuta*, in which the lateral lamellae of the anterior region are low, obtuse-triangular, and broadly attached. The differences between *M. pettiboneae* and *M. californica* are somewhat more subtle: the lateral lamellae of the posterior region are more elongate and paddle-shaped in *M. californica;* there is a prominent setal ridge in the posterior region of *M. pettiboneae;* there is no black pigmentation anywhere on *M. pettiboneae;* and *M. pettiboneae* bears both notopodial and neuropodial medial lamellae in the posterior region, while these structures are not reported for *M. californica.*

Previous to the present paper the only species of *Magelona* recorded from the Gulf of Mexico was a so-called "*Magelona*, near *californica* . . . from Alligator Harbor, Franklin Co., Florida . . . " (Hartman, 1951, p. 90) and "*Magelona californica prox.* Hartman" collected ". . . only at the typical bay beach [of Alligator Harbor] station . . ." (Carpenter, 1956, p. 104).

Although I have not examined specimens identified by Hartman as "*Magelona*, near *californica*," among the material observed in the course of this study is a series of specimens collected by Donald Carpenter (presumably from his "typical bay beach station," the only area in which he reports *Magelona californica prox.*). These are not *M. californica*, but are *M. pettiboneae.* Hartman, in her discussion of *Magelona*, near *californica* (1951, pp. 90, 91), refers to "paired speckled areas on the dorsal side of the thorax" but does not state whether these are "fine, black specks" as in *M. californica* (Hartman, 1944b, p. 320) or aggregations of opaque brownish yellow granules (as has been observed in *M. pettiboneae*). The only unequivocal point of difference she offers to separate *M. californica* and *M.* nr. *californica* is that ". . . [in *Magelona*, near *californica*] there is no lateral pigment in the abdomen such as occurs in *M. californica*, from California" (Hartman, 1951, p. 91). Unfortunately, she does not comment on the presence or absence of medial lamellae in the posterior region.

In light of the preceding comments, I feel justified in considering "*Magelona*, near *californica*" of Hartman (1951) and "*Magelona californica prox.*" of Carpenter (1956) as synonyms of *M. pettiboneae.*

Magelona pettiboneae lanceolata, new subspecies

Figures 48–59

Differential Diagnosis: *Magelona pettiboneae* with lateral lamellae of the anterior setigers of the posterior region lanceolate; with straight-shafted, heavy, hooded hooks.

Type Locality: The sandy bottom of a tidal pond at the Gulf end of Ten-Mile Access Road, 10 miles southwest of Port Aransas, Mustang Island, Nueces County, Texas.

Description: The holotype and the two paratypes are all incomplete anterior fragments. The holotype is comprised of 23 setigers (6 mm. in length, 0.5 mm. in width); one paratype, of 20 setigers (5 mm. in length, 0.5 mm. in width); and the other, of 23 setigers (5.5 mm. in length, 0.5 mm. in width). An ovigerous posterior fragment, terminating in an anus, has 52 setigers (19 mm. in length, 0.5 mm. in width), of which the last 49 contain eggs.

There are no pigmented areas to be seen on the three specimens. Patches of opaque granular material are distributed in essentially the same pattern as was the case in the stem species.

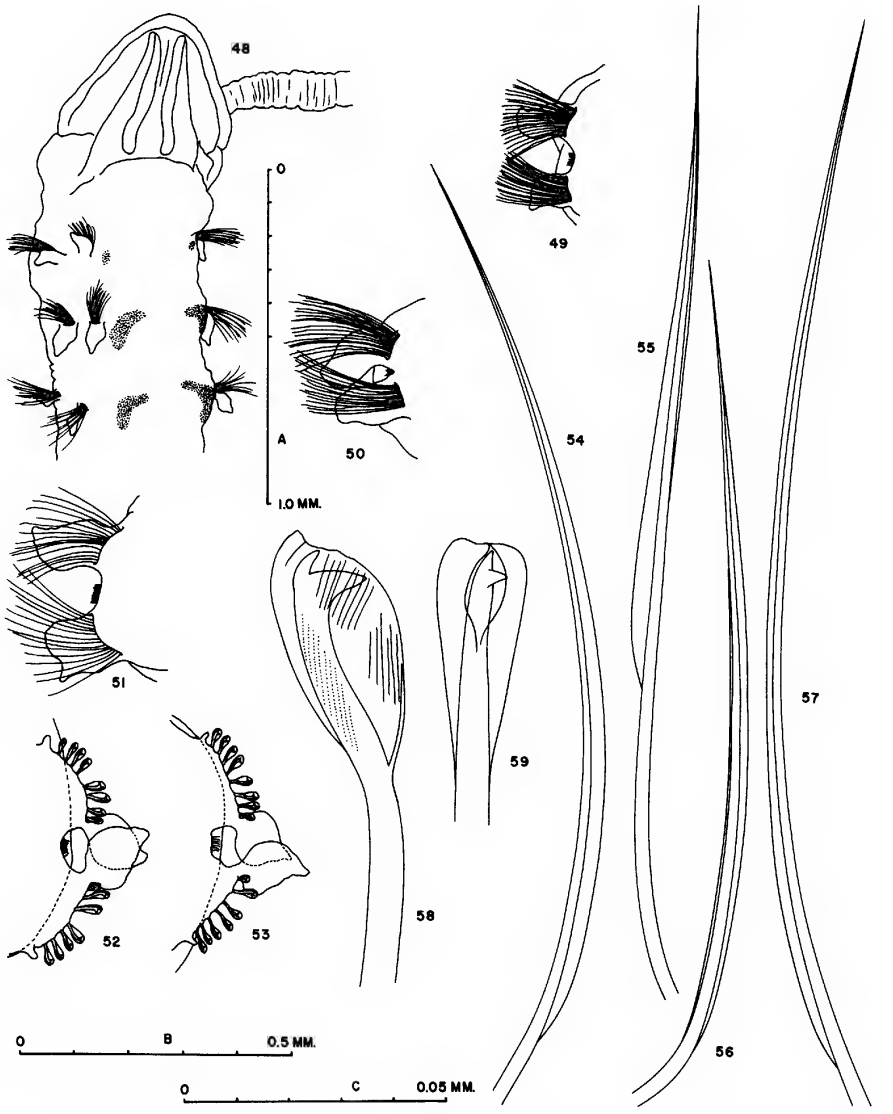
The prostomium of *Magelona pettiboneae lanceolata* (fig. 48) is slightly wider than long. It bears no frontal horns, and the anterior margin is smoothly rounded. The medial prostomial ridges are separate along their length and diverge somewhat near their posterior ends. Lateral prostomial ridges are present, closely situated to the medial; these are tapered toward their narrow anterior ends.

The palps are inserted on the ventroposterior surface of the prostomium and bear six rows of papillae basally and four rows apically. There are no pigmented areas on the palps.

Parapodia of the anterior region (figs. 49, 50) are provided with paired lateral lamellae only. These are sublanceolate in shape and are laterally situated. The lamellae of the more anterior setigers (fig. 49) are placed farther apart than those more posterior (fig. 50).

The ninth setiger (fig. 51) is also provided with lateral lamellae only. The notopodial lateral lamella is somewhat pointed, and the neuropodial lateral lamella is rounded at its tip and bears a subapical protrusion on its ventral margin.

Posterior setigers of *M. pettiboneae lanceolata* (figs. 52, 53) are all provided



FIGS. 48–59. *Magelona pettiboneae lanceolata*, new subspecies. 48. Dorsolateral view of anterior region, tip of right palp omitted, left palp missing; stippled regions represent areas of granular aggregations. 49. Anterior view of right fifth setiger. 50. Anterior view of right eighth setiger. 51. Anterior view of right ninth setiger. 52. Posterior view of right tenth setiger. 53. Posterior view of right eighteenth setiger. 54. Unilimbate capillary seta from fifth setiger. 55. Bilimbate capillary seta from eighth setiger. 56. A second bilimbate capillary seta from the eighth setiger. 57. Unilimbate capillary seta from ninth setiger. 58. Profile view of a hooded hook. 59. Three-quarter view of a hooded hook.

48, scale A; 49–53, scale B; 54–59, scale C.

with paired medial and lateral lamellae. Lateral lamellae are lanceolate, with acute tips, and are borne on constricted bases. Medial lamellae are small and are found at the medial end of the ridge that bears the hooded hooks. There are approximately eight hooks in each setal fascicle of the tenth and eighteenth setigers. Tufts of cilia were observed between the lateral lamellae of all setigers.

The setae of the anterior region are unilimbate capillaries with a broad limbation (figs. 54, 55); there are also a few bilimbate capillary setae with a broad and a very narrow limbation (fig. 56). The setae of the ninth setiger are similar to those of the preceding setiger (fig. 57) and are not modified or specialized.

The hooded hooks of the Mustang Island subspecies are all bidentate (figs. 58, 59). The main fang is at nearly right angles to the axis of the shaft, and the single accessory tooth is slightly bent toward the tip of the main fang. Hoods are provided with an aperture (fig. 59), but the main fang does not protrude through it. The shaft is relatively straight and bends in a gently sinuous curve. The neck of the shaft, just proximal to the terminal dentition, is not particularly narrowed.

No lateral pouches were seen on any of the posterior segments, and the specimens were not associated with tubes.

Type Disposition: The holotype (A.M.N.H. No. 3653) and a paratype (A.M.N.H. No. 3654) are deposited in the collections of the American Museum of Natural History. Paratypic material has also been deposited in the collections of the United States National Museum.

Discussion: In a comparison with the stem species, there are many points of difference which set *Magelona pettiboneae lanceolata* apart, none of which, in my opinion, represents more than a subspecific difference.

The main differential characteristics, followed parenthetically by a statement of the condition in the new subspecies, are: (1) the placement of parapodia in the anterior region (all are lateral); (2) the shape of the lateral lamellae of the anterior setigers of the posterior region (lanceolate with acute tips); (3) setae of the anterior region (wide limbation); and (4) morphology of hooded hooks (straighter shaft, thicker neck).

GENERAL DISCUSSION

The new species described above bring the total species of *Magelona* to 21. These species are here listed with their type localities:

M. papillicornis Müller, 1858, St. Catherine Island, Brazil
M. longicornis Johnson, 1901, Puget Sound, Washington

M. obockensis Gravier, 1905, African coast, Red Sea
M. rosea Moore, 1907, Woods Hole, Massachusetts
M. cincta Ehlers, 1908, Algoa Bay, South Africa
M. pacifica Monro, 1933, Pacific coast, Panama
M. japonica Okuda, 1937, Onagawa, Japan
M. pitelkai Hartman, 1944a, Tomales Bay, central California
M. californica Hartman, 1944b, Mission Bay, southern California
M. cornuta Wesenberg-Lund, 1949, Gulf of Iran
M. cerae Hartman and Reish, 1950, off Coos Bay, Oregon
M. alleni Wilson, 1958, Mill Bay, Salcombe, England
M. filiformis Wilson, 1959, Mill Bay, Salcombe, England
M. sacculata Hartman, 1961, San Pedro Shelf, off southern California
M. capensis Day, 1961, Agulhas Bank, South Africa
M. minuta Eliason, 1962, Öresund
M. annulata Hartmann-Schröder, 1962, Isla Blanca, Peru
M. phyllisae, new species, off Santa, Peru
M. polydentata, new species, Bimini, Bahamas
M. riojai, new species, Antón Lizardo, Mexico
M. pettiboneae, new species, St. Andrew Bay, northwest Florida

On the basis of personal observation of some, and a critical perusal of the original descriptions and illustrations of the remaining, species of *Magelona*, a key for their identification has been formulated. The crucial morphological characters of importance are: (1) the fine structure of the hooded hooks of the posterior region; (2) the presence or absence of prostomial horns; (3) the presence or absence of medial lamellae in the posterior region; (4) the presence or absence of specialized setae of various types on the ninth setiger; (5) the morphology of the anterior lateral lamellae; and (6) the relative dimensions of the prostomium.

Key to the Species of *Magelona* Müller, 1858

1. With hooded hooks of the posterior region bidentate 2
   With hooded hooks of the posterior region tridentate 9
   With hooded hooks of the posterior region polydentate, with up to five accessory teeth above the main fang . . . . . *M. polydentata*, new species
2. Prostomium bearing frontal horns 3
   Prostomium without frontal horns 7
3. With an accessory notopodial lamella between medial and lateral lamellae in posterior region . . . . . *M. annulata*
   Without an accessory notopodial lamella between medial and lateral lamellae in posterior region 4
4. With both neuropodial and notopodial medial lamellae in posterior region . . 5
   With neither neuropodial nor notopodial medial lamellae in posterior region . 6
5. With medial and lateral lamellae of the posterior region subequal in size . . . . . *M. phyllisae*, new species
   With medial lamellae of the posterior region much smaller than the lateral

lamellae ..... *M. longicornis*

6. Of the lateral lamellae of the anterior region, the notopodial are larger than the neuropodial; lateral lamellae of the posterior region are oval or suboval ..... *M. pacifica*

Lateral lamellae of the anterior region are subequal in size; lateral lamellae of the posterior region are lanceolate and attenuate ..... *M. cerae*

7. With neither neuropodial nor notopodial medial lamellae in the posterior region ..... *M. californica*

With both neuropodial and notopodial medial lamellae in the posterior region 8

8. With anterior lateral lamellae erect and elongate; narrowly attached ..... *M. pettiboneae*, new species

With anterior lateral lamellae low and obtuse-triangular; broadly attached ..... *M. minuta*

9. Prostomium bearing frontal horns 10

Prostomium without frontal horns 13

10. With neither neuropodial nor notopodial medial lamellae in the posterior region ..... *M. cincta*

With both neuropodial and notopodial medial lamellae in the posterior region 11

11. With specialized setae on the ninth setiger ..... *M. pitelkai*

Without specialized setae on the ninth setiger 12

12. With four pairs of lamellar processes on segments of the anterior region ..... *M. cornuta*

With three pairs of lamellar processes on segments of the anterior region ..... *M. filiformis*

With two pairs of lamellar processes on segments of the anterior region ..... *M. japonica*

13. Without specialized setae on the ninth setiger 14

With specialized setae on the ninth setiger 15

14. With both neuropodial and notopodial medial lamellae in the posterior region ..... *M. rosea*

With only notopodial medial lamellae in the posterior region ..... *M. capensis*

With neither neuropodial nor notopodial medial lamellae in the posterior region ..... *M. alleni*

15. Specialized setae of the ninth setiger with an expanded, subterminal limbation; with neuropodial medial lamellae of posterior region lateral to rows of hooded hooks ..... *M. obockensis*

Specialized setae of the ninth setiger crenulate (but not asymmetric) or mucronate or both; with neuropodial medial lamellae of posterior region absent or, if present, medial to rows of hooded hooks 16

16. Width of the prostomium equal to or greater than its length ..... *M. sacculata*

Length of the prostomium from 1.5 to 2.0 times its width 17

17. Anterior margin of the prostomium rounded; specialized setae of the ninth setiger are all mucronated ..... *M. papillicornis*

Anterior margin of the prostomium truncated; specialized setae of the ninth setiger are crenulated and mucronated ..... *M. riojai*, new species

For the most part, the allocation of various species to the sequence of

couplets in the key requires no further comment. Consideration has been given to the corrections made by subsequent workers. For example, Ehlers (1908) attributed a bidentate hook to *Magelona cincta*, as well as a prostomium devoid of frontal horns, but Wilson (1958), as a result of the reëxamination of the holotype of *M. cincta*, found that the hooded hooks were tridentate and the prostomium possessed horns. Similarly, the placement of *M. cornuta* is based on Wilson's (1959) observations on type material of this species.

It will be noted that I have included *M. pacifica* with *M. cerae* in a couplet that requires the absence of medial lamellae in the posterior region. Monro, in his description of *M. pacifica* (1933), is quite explicit in stating that there are no "cirriform processes" (= medial lamellae) on posterior parapodia. Neither of his two figures of posterior parapodia shows medial lamellae to be present. Hartman (1944b) identified two specimens from rather shallow subtidal depths off two of the Channel Islands near the southern California coast. Although she gives no illustrations of these specimens, her descriptive account of them agrees with Monro's description of *M. pacifica* on all but one point, namely, that her specimens possessed both "dorsal and ventral cirri" (= notopodial and neuropodial medial lamellae). Uschakov (1955) recorded a species he identified as *M. pacifica* from various localities off the Pacific coast of Siberia. Although his text is concerned mainly with the pigmentation of his specimens, the figures that Uschakov presents are generally similar to those in Monro's original description, with the exception that the Siberian specimens possess small medial lamellae in the posterior region. Because Monro (1933) states categorically that such structures are absent and fails to show them in his figures, it is my opinion that the specimens identified by both Hartman (1944b) and Uschakov (1955) as *M. pacifica* are not Monro's species. In addition to this morphological basis, it does not seem too probable that an intertidal species from tropical Panama would extend so far north as the coasts of Siberia and California.

In the key above I have included *Magelona pitelkai* in the group possessing tridentate hooded hooks and prostomial horns. Through the kindness of Dr. Marian H. Pettibone, United States National Museum, I have examined a specimen of *Magelona* from False Bay, San Juan Island, Puget Sound, Washington. It is an anterior fragment collected by M. Miller in the summer of 1937, is 20 mm. long, 0.75 mm. wide, and is comprised of 31 setigerous segments. Parapodial morphology, the specialized setae of the ninth setiger, and the fine structure of the hooded hooks are all in accord with the original description of *Magelona pitelkai* Hartman (1944a). However, the prostomium of the specimen from Puget Sound

(fig. 59), although it is bent dorsally and appears somewhat foreshortened, clearly shows a pair of small prostomial horns. These are visible only with the careful focusing of a compound microscope, and it is possible that with lower magnifications these horns would give the prostomium the truncated appearance Hartman shows (1944a, pl. 19, fig. 1) and would justify the comment by Berkeley and Berkeley (1952) that this species lacks prostomial horns.

The final comment regarding the key to the species of *Magelona* is concerned with the status of *M. longicornis* Johnson (1901). For some time, many workers have considered this as a species *incertae sedis*, because of the rather unclear illustrations and the somewhat confusing description given by Johnson. Gravier (1906) found the description very brief, and Hartman (1944b) considered the species to be "incompletely known" and later (Hartman, 1959, p. 393), to be "indeterminable."

Johnson's description, while leaving something to be desired, is not a total loss. The expanded anterior tip of the prostomium, which he mentions, would indicate that his species possesses prostomial horns (and there is a subtle indication of this in his illustration). In the anterior region he mentions three parapodial structures, small dorsal and ventral "cirri" and a small "branchia" between them. Thus, we might assume that the parapodia of the anterior region bear notopodial and neuropodial medial lamellae (Johnson's "cirri") and a lateral lamella (his "branchia"). In the posterior region he mentions that "branchiae" and "cirri" are larger. His figure of the transitional segments (setigers 8 to 11) shows a pair of lanceolate lateral lamellae on the left side of the tenth setiger. Thus we may assume that posterior parapodia are provided with paired lateral lamellae on each side and that there are at least notopodial or neuropodial medial lamellae, if not both. Finally, Johnson describes the uncini (= hooded hooks) as bidentate.

Once again through the kindness of Dr. Pettibone, I have examined two specimens from Crescent Beach, near Dutchers Cove, Case Inlet, Puget Sound, Washington. They were collected by Pettibone on June 21, 1947, from a "sandy, gravelly beach." One anterior fragment, of 26 setigers, was 10 mm. long and 0.75 mm. wide, and another, of 24 setigers, was 11 mm. long and 0.75 mm. wide; there is also an ovigerous fragment from the mid-region.

If the assumptions made above, based on Johnson's description, are valid, then these two anterior fragments are *Magelona longicornis*, as the following short description and illustrations (figs. 60–68) show. It should be noted, as well, that the account below agrees in essentials with Wilson's (1959, pp. 552–553) observations on certain specimens, labeled *M. longi-*

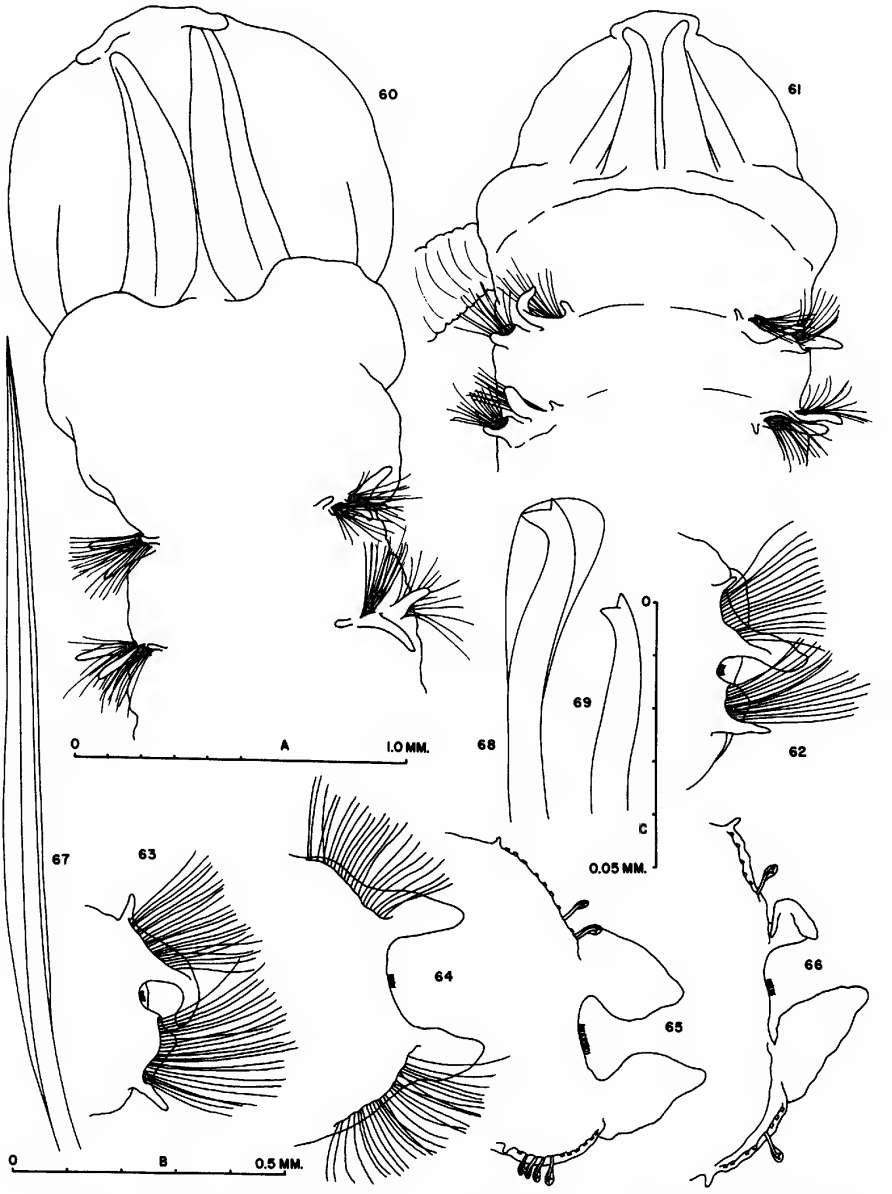


FIG. 60. *Magelona pitelkai* Hartman, dorsal view of prostomial region, both palps missing.

FIGS. 61–69. *Magelona longicornis* Johnson. 61. Dorsal view of prostomial region, tip of left palp omitted, right palp missing. 62. Anterior view of left fifth setiger. 63. Anterior view of left eighth setiger. 64. Anterior view of left ninth setiger. 65. Anterior view of left tenth setiger, most hooded hooks broken. 66. Anterior view of left eighteenth setiger, most hooded hooks broken. 67. Bilimbate capillary seta from ninth setiger. 68. Profile view of a hooded hook. 69. Three-quarter view of a hooded hook, hood omitted.

60, 61 scale A; 62–66, scale B; 67–69, scale C.

cornis, in the collections of the British Museum (Natural History).

The prostomium (fig. 60) is broader than long and bears a pair of small frontal horns. Two pairs of prostomial ridges are present, the anterior tips of the medial pair diverge toward the horns, and the lateral pair approach the central pair at an oblique angle.

The fifth setiger (fig. 61) bears notopodial and neuropodial medial lamellae and a larger, somewhat flattened, notopodial lateral lamella. The structure of the eighth setiger (fig. 62) is similar to that of the fifth.

The ninth setiger (fig. 63) is provided with only lateral lamellae; no medial lamellae were seen.

The tenth setiger (fig. 64) bears two pairs of small medial lamellae and two pairs of lateral lamellae.

The lateral lamellae are lanceolate in shape and appear to be attached by rather constricted bases. The lamellae of the eighteenth setiger (fig. 65) are similar to those of the tenth. As in the case of almost all the species of *Magelona* treated above, small tufts of cilia were noted between the lateral lamellae of all setigers.

The setae of the first nine setigers are all unilimbate capillaries (fig. 66). The setae of the ninth setiger are not modified or specialized in any way.

Although many of the hooded hooks of the posterior region have been broken, a sufficient number are intact for one to observe that they are bidentate (figs. 67, 68) and that they do not protrude from their hoods.

Thus, *Magelona longicornis* Johnson may be differentiated from other species of *Magelona* by its bidentate hooded hooks, by its prostomial horns, and by the presence of small neuropodial and notopodial medial lamellae.

Uschakov (1955) recorded a species he identifies as *M. longicornis* from the coast of Siberia and, later (Uschakov and Bao-Ling, 1962), from the Yellow Sea. On the basis of his illustration (Uschakov, 1955, fig. 99A), I cannot agree that his specimens, without prostomial horns, are *M. longicornis*. In the accompanying notes (p. 280), Uschakov describes lateral pockets which he conjectures might be concerned with reproduction. If the hooded hooks of his specimens are tridentate (he does not mention the fine structure of the hooks) and the setae of the ninth setiger are specialized, then it is possible that his material, from the far western shores of the Pacific, has affinities with the closely related group of species mentioned previously (*M. obockensis*, *M. papillicornis*, *M. sacculata*, and *M. riojai*).

It may be noted that, in most of the descriptions above, reference has been made to tufts of cilia between the dorsal and ventral lateral lamellae of all setigers. In most cases the material that was suitable for parapodial

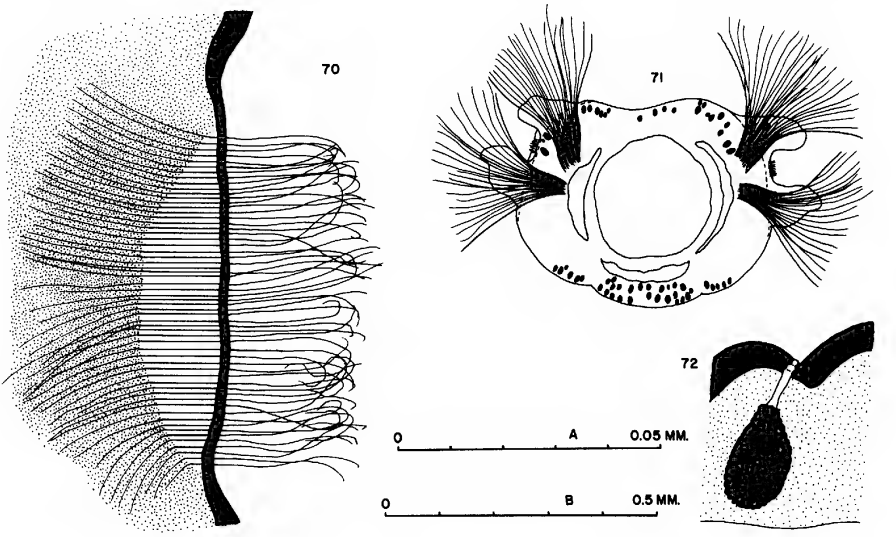


FIG. 70. *Magelona longicornis* Johnson, transverse section of a lateral organ of the ninth setiger; stippled area to the left, hypodermis; solid area, cuticle.

FIGS. 71, 72. *Magelona pettiboneae*, new species. 71. Transverse optical section of the eighth setiger. The solid areas represent the distribution of material stained with Rose Bengal; in all cases they are closely associated with the cuticle and their position apparently away from the body surface is due to the thickness of the free-hand section. 72. A single granular mass, showing the narrow communicating passageway through the cuticular layer.

70, 72, scale A; 71, scale B.

observation was too thick for the details of associated structures to be made out. However, in the case of the ninth setiger of *Magelona longicornis*, relatively detailed observations of the ciliated area were possible (fig. 70). In spite of the fact that the tissue was not stained, and nuclei and cell walls were not visible, it was seen that the cilia are free extensions of fine, fibrilar structures which originate in the subcuticular region. The overlying cuticle in this area is perceptibly thinner than in other parts of the body. The cilia appear to penetrate and pass through the cuticle. Beneath the cuticle there is a lenticular, pocket-like area which appears to be devoid of cytoplasm. Here the cilia (or their proximal extensions) are arranged in rather close-packed, parallel rows.

Although such structures have not been recorded for the magelonids, they show a great similarity to the lateral organs of certain orbiniids and spionids, as figured by Rullier (1951; fig. 7A, *Scolopos armiger;* fig. 7B, *Aricia latreilli;* fig. 11D, *Scolelepis fulginosa;* and fig. 11E, *Nerine cirratulus*).

Further cytological studies and a description of the micromorphology of these, the lateral organs of the magelonids, must await properly stained and sectioned material.

A second interesting microstructure was noted during the study of setae under oil immersion. It has been mentioned that, in some cases, specimens were treated with Rose Bengal stain, and that certain areas seemed to be selectively stained. These stained regions coincided with the location of aggregations of opaque granular material the unstained color of which varied from white to brownish yellow. In a thick freehand cross section of the eighth setiger of *Magelona pettiboneae* (fig. 71), it is noted that the Rose-Bengal-staining material is distributed on both the dorsal and ventral surfaces. Under oil immersion it is seen that each "granule" lies just beneath the cuticle (fig. 72) and that the body of the structure is composed of numerous individual granules. The granular mass is in communication with the external surface of the cuticular layer by a constricted passageway, which, in the present preparations, is amber-colored and has a glassy appearance.

Although the granular appearance does not agree with McIntosh's description, these may represent the so-called "bacillary cells" observed by him in *Magelona papillicornis* (1877, p. 148; 1911, p. 426). He noted that such structures ". . . cover for the most part the entire anterior region, and besides being continuous along the sides in the posterior region, form a band across the body behind each row of hooks" (McIntosh, 1911, p. 426). This is essentially the distribution of the Rose-Bengal-staining bodies in *Magelona pettiboneae*. The granular appearance of the contents of these structures may represent a fixation artifact, and it is possible that, in life, the granules are actually the "rod-like bacillary bodies" that McIntosh noted in his *in vivo* observations.

At the present time little more can be said concerning the structure of these curious granular aggregations, and a detailed description of them, like that of the lateral organs mentioned above, remains to be accomplished.

LITERATURE CITED

Berkeley, Edith, and Cyril Berkeley
1952. Polychaeta sedentaria. No. 9b (2). *In* Canadian Pacific Fauna. Toronto, pp. 1–139.

Carpenter, Donald G.
1956. Distribution of polychaete annelids in the Alligator Harbor area, Franklin County, Florida. Florida State Univ. Studies, no. 22, pp. 89–110.

DAY, JOHN H.
1961. The polychaet fauna of South Africa. Part 6. Sedentary species dredged off Cape coasts with a few new records from the shore. Jour. Linnean Soc. London, Zool., vol. 44, pp. 463–560.

EHLERS, ERNST
1908. Die bodensässigen Anneliden aus den Sammlungen der deutschen Tiefsee-Expedition. *In* Chun, Carl (ed.), Wissenschaftliche Ergebnisse der deutschen Tiefsee-Expedition auf dem Dampfer "Valdivia" 1898–1899. Jena, Gustav Fischer, vol. 16, pp. 1–168.

ELIASON, ANDERS
1962. Undersökningar över Öresund. XXXXI. Weitere Untersuchungen über die Polychaetenfauna des Öresunds. Lunds Univ. Arsskr., new ser., sect. 2, vol. 58, no. 9, pp. 1–98.

GRAVIER, C.
1905. Sur les annélides polychètes de la Mer Rouge (Cirratuliens, Spionidiens, Ariciens). Bull. Mus. d'Hist. Nat. Paris, vol. 11, pp. 42–46.
1906. Contribution a l'étude des annélides polychètes de la Mer Rouge. Nouv. Arch. Mus. d'Hist. Nat. Paris, ser. 4, vol. 8, pp. 123–236.

HARTMAN, OLGA
1944a. Polychaetous annelids from California including the descriptions of two new genera and nine new species. Allan Hancock Found. Publ., Pacific Expeds., vol. 10, pp. 237–307.
1944b. Polychaetous annelids. Pt. 6. Paraonidae, Magelonidae, Longosomidae, Ctenodrilidae, and Sabellariidae. *Ibid.*, vol. 10, pp. 309–389.
1951. The littoral marine annelids of the Gulf of Mexico. Publ. Inst. Marine Sci. Univ. Texas, vol. 2, pp. 7–124.
1959. Catalogue of the polychaetous annelids of the world. Allan Hancock Found. Publ., Occas. Paper, no. 23, pp. 1–628.
1961. Polychaetous annelids from California. Allan Hancock Found. Publ., Pacific Expeds., vol. 25, pp. 1–226.

HARTMAN, OLGA, AND DONALD J. REISH
1950. The marine annelids of Oregon. Oregon State Monogr. Studies in Zool., no. 6, pp. 1–64.

HARTMANN-SCHRÖDER, GESA
1962. Zweiter Beitrag zur Polychaetenfauna von Peru. Kieler Meeresforsch., vol. 18, pp. 109–147.

JOHNSON, HERBERT P.
1901. The Polychaeta of the Puget Sound region. Proc. Boston Soc. Nat. Hist., vol. 29, pp. 381–437.

MCINTOSH, WILLIAM C.
1877. On the structure of *Magelona*. Ann. Mag. Nat. Hist., ser. 4, vol. 20, pp. 147–152.
1911. On the structure of *Magelona*. *Ibid.*, ser. 8, vol. 7, pp. 417–457.
1915. A monograph of the British marine annelids. Vol. 3. Polychaeta—Opheliidae to Ammocharidae. London, Ray Society, pp. 1–368.

MENZEL, R. WINSTON
1956. Annotated check-list of the marine fauna and flora of the St. George's Sound–Apalachee Bay region, Florida Gulf coast. Tallahassee, Florida, the Oceanographic Institute, Florida State University, mimeographed, iv+78 pp.

Mésnil, Félix
1896. Études de morphologie externe chez les annélides. I. Les spionidiens des côtes de la Manche. Bull. Sci. France Belgique, vol. 29, pp. 110–287.

Monro, Charles C. A.
1933. The Polychaeta Sedentaria collected by Dr. C. Crossland at Colón, in the Panama region, and the Galapagos Islands during the expedition of the S. Y. "St. George." Proc. Zool. Soc. London, pp. 1039–1092.

Moore, J. Percy
1907. Descriptions of new species of spioniform annelids. Proc. Acad. Nat. Sci. Philadelphia, vol. 59, pp. 195–207.

Müller, Fritz
1858. Einiges über die Annelidenfauna der Insel Santa Catharina an der brasilianischen Küste. Arch. Naturgesch, vol. 1, for 1858, pp. 211–220.

Okuda, Shiro
1937. Spioniform polychaetes from Japan. Jour. Fac. Sci. Hokkaido Imp. Univ., ser. 6, Zool., vol. 5, pp. 217–254.

Rullier, François
1951. Étude morphologique, histologique et physiologique de l'organe nucal chez les annélides polychètes sédentaires. Ann. de l'Inst. Oceanogr., vol. 25, pp. 207–341.

Uschakov, P. V.
1955. Mnogoshchetinkovye chervi dal'nevostochnykh morei SSSR [Polychaetous annelids of the far eastern seas of the U.S.S.R.] (Polychaeta). Opredeliteli po faune SSSR, Akad. Nauk SSSR, no. 56, pp. 1–445.

Uschakov, P. V., and Wu Bao-Ling
1962. Mnogoshchetinkovye chervi (Polychaeta) Zheltovo morya i svyazannye s nimi nekotorye voprosy zoogeografii severozapadnoi chasti Tikhovo okeana [Polychaetous annelids (Polychaeta) of the Yellow Sea with reference to certain zoogeographical problems of the northwest region of the Pacific Ocean]. Komissiya po rybokhozyaĭstvennomu issledovaniyu zapadnoĭ chasti Tikhovo okeana, Konferentsiya po sovmestnym issledovaniyam fauny i flory [Commission for fisheries research of the western region of the Pacific Ocean, Conference for joint research of fauna and flora]. Zool. Inst. Akad. Nauk SSSR, Leningrad, pp. 1–12.

Wesenberg-Lund, Elise
1949. Polychaetes of the Iranian Gulf. *In* Jessen, Knud, and Ragnar Spärck (eds.), Danish scientific investigations in Iran. Copenhagen, pt. 4, pp. 247–400.

Wilson, Douglas P.
1958. The polychaete *Magelona alleni* n. sp. and a re-assessment of *Magelona cincta* Ehlers. Jour. Marine Biol. Assoc. Plymouth, vol. 37, pp. 617–626.
1959. The polychaete *Magelona filiformis* sp. nov. and notes on other species of *Magelona*. *Ibid.*, vol. 38, pp. 547–556.